HEALTH ADVISORY

SAFE EATING GUIDELINES FOR FISH FROM TRINITY LAKE, LEWISTON LAKE, CARRVILLE POND, THE TRINITY RIVER UPSTREAM FROM TRINITY LAKE AND THE EAST FORK TRINITY RIVER (TRINITY COUNTY)

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EXECUTIVE SUMMARY

The United States Geological Survey (USGS) conducted a reconnaissance survey of mercury contamination in edible fish tissue from Trinity Lake and selected water bodies in the Trinity River watershed, an area possibly affected by historic gold and mercury mining. These data were evaluated by the Office of Environmental Health Hazard Assessment (OEHHA), together with fish samples collected in this region through the Surface Water Ambient Monitoring Program (SWAMP), in an effort to determine whether there may be potential adverse health effects associated with the consumption of sport fish from these water bodies.

Almost all fish contain detectable levels of mercury, more than 95 percent of which occurs as methylmercury, a highly toxic form of the element. Consumption of fish is the major route of exposure to methylmercury in the United States. The critical target of methylmercury toxicity is the nervous system, particularly in developing organisms such as the fetus and young children. Significant methylmercury toxicity can occur to the fetus during pregnancy even in the absence of symptoms in the mother. In 1985, the United States Environmental Protection Agency (U.S. EPA) set a reference dose (RfD, that is the daily exposure likely to be without significant risk of deleterious effects during a lifetime) for methylmercury of $3x10^{-4}$ mg/kg-day, based on central nervous system effects (ataxia and paresthesias) in adults. In 1995, and confirmed in 2001, this RfD was lowered to $1x10^{-4}$ mg/kg-day, based on developmental neurologic abnormalities in infants exposed *in utero*, using the Iraqi and Faroe Island data, respectively. OEHHA finds convincing evidence that the fetus is more sensitive than adults to the neurotoxic effects of mercury, but also recognizes that fish can play an important role in a healthy diet, particularly when it replaces other, higher fat sources of protein. Numerous human and animal studies have shown that fish oils have beneficial cardiovascular and neurological effects. Because it is important to protect the most sensitive population without unduly restricting fish consumption in others, OEHHA chooses to use both the current and previous U.S. EPA reference doses for two distinct population groups. In these guidelines, the current RfD based on effects in infants will be used for women of childbearing age and children aged 17 and younger. The previous RfD, based on effects in adults, will be used for women beyond their childbearing years and men.

In order to provide safe eating guidelines for various fish species, mean mercury concentrations in fish from a site or region are compared to OEHHA guidance tissue levels for methylmercury, which are designed so that individuals consuming no more than a preset number of meals should not exceed the RfD for this chemical. Safe eating guidelines identify those fish species with high mercury levels whose consumption should be restricted or avoided altogether (see the "Caution" table), as well as those low-mercury fish that may be consumed frequently (two or more times per week) as part of a healthy diet (see the "Best Choices" table). A statistically representative sample size was available to provide safe eating guidelines for largemouth bass, smallmouth bass, white catfish, brown trout, and rainbow trout from Trinity Lake, and rainbow trout from Lewiston Lake, Carrville Pond, the Trinity River upstream from Trinity Lake, and the East Fork Trinity River. Supporting data (such as mercury concentration for a closely related species at a similar trophic level) were used to develop additional consumption guidelines for Chinook salmon from Trinity Lake.

All individuals, especially women of childbearing age and children aged 17 and younger, are advised to follow the safe eating guidelines to ensure that their methylmercury ingestion does not exceed the reference dose. With the exception of ocean or river-run salmon or steelhead, which may be consumed more frequently, for other generally low mercury fish species not included in this evaluation, but potentially found in these water bodies (e.g., green sunfish, Kokanee salmon, brown and black bullhead), OEHHA advises that women of childbearing age and children aged 17 and younger follow the recent U.S. EPA and U.S. Food and Drug Administration (U.S. FDA) Joint Federal Advisory for Mercury in Fish. This advisory recommends that pregnant women or women who may become pregnant, nursing mothers and young children consume no more than one meal per week of locally caught fish, when no other advice is available, and eat no other fish that week. OEHHA recommends that children through age 17 also follow this advice because of continued nervous system development during adolescence. Meal sizes should be adjusted to body weight as described in the safe eating guidelines table.

For general advice on how to limit your exposure to chemical contaminants in sport fish (e.g., eating smaller fish of legal size), as well as a fact sheet on methylmercury in sport fish, see the California Sport Fish Consumption Advisories (http://www.oehha.ca.gov/fish.html) and Appendix 2. Advice for other California water bodies can be found online at: http://www.oehha.ca.gov/fish/so_cal/index.html. It should be noted that, unlike the case for many organic contaminants, various cooking and cleaning techniques will not reduce the methylmercury content of fish.

SAFE EATING GUIDELINES

FISH CONSUMPTION FROM TRINITY LAKE, LEWISTON LAKE, CARRVILLE POND, THE TRINITY RIVER UPSTREAM OF TRINITY LAKE, AND THE EAST FORK TRINITY RIVER

Fish are nutritious and should be part of a healthy, balanced diet. It is important, however, to choose your fish wisely. OEHHA recommends that you choose fish to eat that are low in mercury, including the following fish caught from Trinity Lake, Lewiston Lake, Carrville Pond, the Trinity River upstream of Trinity Lake, and the East Fork Trinity River.

BEST CHOICES **EAT UP TO 3 TIMES PER WEEK**
Women of childbearing age and children 17 years and younger:
All trout from Lewiston Lake, Carrville Pond, or the Trinity River upstream of Trinity Lake
Women beyond childbearing age and men:
All trout or white catfish from any listed site

Because some other types of fish from these water bodies contain higher levels of mercury, OEHHA provides the following recommendations that you can follow to reduce the risks from exposure to mercury in fish.

CAUTION **LIMIT CONSUMPTION TO NO MORE THAN:**	
Women of childbearing age and children 17 years and younger:	
Once a Month	Bass or Chinook (King) salmon from Trinity Lake (including rivers and creeks draining into Trinity Lake) ***or***
Once a Week	White catfish or trout from Trinity Lake and the East Fork Trinity River
Women beyond childbearing age and adult men:	
Once a Week	Bass or Chinook (King) salmon from Trinity Lake (including rivers and creeks draining into Trinity Lake)

CONTACT WITH THE WATER IS SAFE.
EAT SMALLER FISH OF LEGAL SIZE. Fish accumulate mercury as they grow.
SERVE SMALLER MEALS TO CHILDREN. Meal size is assumed to be 8 ounces for a 160-pound adult. If you weigh more or less than 160 pounds, add or subtract one ounce to your meal size, respectively, for each 20-pound difference in body weight.
DO NOT COMBINE FISH CONSUMPTION ADVICE. If you eat multiple species or catch fish from more than one area, the recommended guidelines for different species and locations should not be combined.
CONSIDER YOUR TOTAL FISH CONSUMPTION. Fish from many sources (including stores and restaurants) can contain elevated levels of mercury and other contaminants. If you eat commercial and/or sport fish with lower contaminant levels, you can safely eat more fish. The American Heart Association recommends that healthy adults eat at least two servings of fish per week. Commercial fish such as shrimp, king crab, scallops, farmed catfish, wild ocean salmon, oysters, tilapia, flounder, and sole generally contain some of the lowest levels of mercury, as do the local fish in the "Best Choices" table.
FISH FROM MANY OTHER WATER BODIES ARE KNOWN OR SUSPECTED TO HAVE ELEVATED MERCURY LEVELS. Not all water bodies in California have been tested. It is recommended that, with the exception of ocean or river-run salmon or steelhead, which may be eaten more frequently, generally low mercury fish from places without published guidelines should be eaten one meal per week or less.